

IN THE CLAIMS

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

1. (Previously presented) A device for unfolding of folded boxes, comprising a magazine for receiving of flat folded-box sleeves, a removing device for individual removal of the folded-box sleeves from the magazine and for feeding the folded-box sleeves to an unfolding device wherein the folded-box sleeves are partially unfolded along a compressing section, the unfolding device including, after the compressing section, a chute for precise fitting receipt of the partially unfolded folded-box sleeves, an output device for removing the partially unfolded-box sleeves from the chute, an expansion chamber following the chute whereat the partially unfolded folded-box sleeves are fully unfolded, and

first and second devices provided at the expansion chamber and operated at the same speed to hold the fully unfolded box sleeves at diagonally opposite edges and to forward the fully unfolded box sleeves.

2. (Previously presented) The device according to Claim 1, wherein the removing device includes several arms having suction heads, and the arms are movable by a drive and a planetary gearing along a cycloidal path.

3. (Previously presented) The device according to Claim 1, wherein the compressing section is defined by a curved slide surface along which the folded-box sleeves are moved.

4. (Previously presented) The device according to Claim 1, wherein the output device includes lugs, each said lug having a lug surface configured to align with a sidewall of the partially unfolded folded-box sleeves.

5. (Previously presented) The device according to Claim 4, wherein an angle (α) in a range of 20 to 25 degrees is provided between each of the lug surfaces and a normal perpendicular to a path of travel of the partially unfolded folded-box sleeves in the chute.

Claims 6-8. (Cancelled)

9. (Previously presented) A device for unfolding of folded-box sleeves, comprising:

a magazine for receiving a plurality of stacked folded-box sleeves;

a removing device having a plurality of arms with suction cups, said arms sequentially removing one of the folded-box sleeves from the magazine;

a compressing section for compressing the folded-box sleeves when said removing device moves the folded-box sleeves therealong to only partially unfold the folded-box sleeves, the compressing section comprising a curved slide surface;

a chute dimensioned to precisely receive the only partially unfolded box sleeves;

an output device for removing the only partially unfolded box sleeves from the removing device and advancing the partially unfolded box sleeves from the chute;

an expansion chamber following the chute for receiving the partially unfolded box sleeves from the chute; and

first and second rotating devices for receiving the only partially unfolded box sleeves and fully unfolding the partially unfolded box sleeves, said first and second rotating devices forwarding the fully unfolded box sleeves from the expansion chamber.

10. (Previously presented) The device according to Claim 9, wherein the output device includes lugs having lug surfaces for contacting the partially unfolded box sleeves,

the lugs defining an angle of 20 degrees to 25 degrees from normal to align with a sidewall of the partially unfolded folded-box sleeves.

11. (Previously presented) A method for unfolding folded boxes, comprising:

providing a plurality of stacked folded-box sleeves in a magazine;

sequentially removing one of the folded-box sleeves from a magazine with a removing device having a plurality of arms with suction cups;

advancing one of the folded-box sleeves supported by one of the plurality of the arms with the suction cups;

compressing the folded-box sleeve during advancement along a compressing section comprising a curved slide surface to only partially unfold the folded-box sleeve;

advancing the only partially unfolded folded-box sleeve with the one of the plurality of the arms into a chute;

removing the only partially unfolded folded-box sleeve from the one of the plurality of the arms using an output device without significant unfolding of the partially unfolded folded-box sleeve;

advancing the partially unfolded box sleeve from the chute without further significant unfolding into an expansion chamber following the chute using the output device; and

fully unfolding the partially unfolded box sleeve in the expansion chamber utilizing first and second rotating devices;

forwarding the fully unfolded box sleeve from the expansion chamber using the first and second rotating devices; and

repeating the above steps for additional folded-box sleeves by the removing the folded-box sleeves from the magazine sequentially utilizing the plurality of arms.

12. (Previously presented) The method according to Claim 11, wherein the step of compressing the folded-box sleeve during advancement along a compressing section comprises compressing the folded-box sleeve against a curved slide surface at an initial force and velocity enabling only the partial unfolding of the folded-box sleeve.

13. (Previously presented) The method according to Claim 11, wherein the step of advancing the partially unfolded box sleeve from the chute without further unfolding the partially unfolded box sleeve comprises contacting the partially unfolded box sleeves with lugs of the output device, the lugs defining an angle of 20 degrees to 25 degrees from normal to align with a wall of the partially unfolded folded-box sleeve.

14. (Previously presented) The device according to Claim 9, wherein the arms are movable through a drive and through a planetary gearing along a cycloidal path having points and curves, wherein the curved slide surface presses against an edge of the folded-box and partially unfolds a folded-box sleeve while the arm carrying the folded-box sleeve moves along a curve of the cycloidal path, and the curved slide surface is adapted to the curvature and distance of the cycloidal path in order to accomplish the compressing and partial unfolding of the folded-box sleeve.

15. (New) The device according to Claim 1, wherein the output device comprises a conveyor with lugs for removing the partially unfolded folded-box sleeves from the chute.

16. (New) The device according to Claim 15, wherein the first and second devices provided at the expansion chamber comprise first and second conveyors for forwarding the fully unfolded box sleeves.

17. (New) The device according to Claim 16, wherein the first and second conveyor include lugs for advancing the fully unfolded box sleeves, said first and second conveyors operating at the same speed.

18. (New) The device according to Claim 9, wherein said output device, said first rotating device and said second rotating device comprise conveyors.

19. (New) The device according to Claim 9, wherein said output device and said first rotating device comprise conveyors adjacent each other and aligned in series to advance the box sleeves along a substantially linear path.

20. (New) The method according to Claim 11, wherein in the step of advancing the partially unfolded box sleeve from the chute, the output device comprises a first conveyor to advance the partially unfolded box sleeve, and in the step of forwarding the fully unfolded box sleeve, the first and second rotating devices comprise second and third conveyors for forwarding the fully unfolded box sleeve from the expansion chamber.

21. (New) A device for erecting folding boxes, comprising:

a loader for holding flat folding-box sleeves, an extractor for extracting the folding-box sleeves singly from the loader and for feeding the folding-box sleeves to an erecting device in which the folding-box sleeves are erected along a curved sliding surface defining a compression section, the erecting device comprising a duct following the compression section for holding only partially erected folding-box sleeves in an exact fit, a removal device for

removing the folding-box sleeves from the duct, and an expansion space adjoining the duct for holding fully erected folding-box sleeves,

wherein the extractor comprises several arms with a suction head for gripping a folding-box sleeve, the arms are movable via a drive and via a planetary gear along a cycloidal path comprising peaks and curves, the sliding surface being provided for compressing and partially erecting a folding-box sleeve by pressing one edge against the sliding surface, during which the arm carrying the folding-box sleeve is moved along a curve, and

wherein the sliding surface is adapted to the curve with respect to curvature and spacing in order to achieve the compression and thus the partial erection of the folding-box sleeve.

22. (New) The device according to Claim 21, wherein the removal device comprises drivers, a driving surface of which corresponds with respect to its orientation to the orientation of a side wall of the partially erected folding-box sleeve.

23. (New) The device according to Claim 22, wherein an angle (α) of 20 to 25 degrees is provided between the driving surface and a vertical to a circulating belt of the removal means.

24. (New) The device according to Claim 21, including a first rotating device for transferring the fully erected folding-box sleeves provided at the expansion space.

25. (New) The device according to Claim 24, wherein the first rotating device is operated at a same speed as a second rotating device for transferring which adjoins the removal means.

26. (New) The device according to Claim 25, wherein drivers of the first and second rotating devices hold the folding boxes at diagonally opposite edges of the folding boxes.

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